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Addressing the Hidden Heart Failure in Mongolia; a Proposal of Heart Failure Patient Education and Disease Management Program

Dulguun Batbold

Addressing the Hidden Heart Failure in Mongolia; a Proposal of Heart Failure Patient Education and Disease Management Program

By

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APPROVAL PAGE

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ABSTRACT

The prevalence of heart failure became a major and growing public health problem globally, with rising mortality numbers causing a great financial burden. In Mongolia, the hospitalization for cardiovascular diseases makes up 55% of all hospitalizations, and mortality rate of circulatory diseases was the highest nationwide, accounting for 36.7% of all deaths (S.Ariuntuya et al., 2011). However, there is still no formal research addressing the prevalence of heart failure in Mongolia. Therefore, this paper is meant to bring awareness of the problem of hidden heart failure in Mongolia, which might be contributing significantly to the cardiovascular disease mortality and health care costs. This paper describes the Mongolian health care structure and the high incidence of heart failure risk factors is identified. Moreover, this paper proposes to develop and adapt a heart failure disease management program, as well as the heart failure patient education program in Mongolia. It is important that Mongolian health care providers and health policy makers acknowledge that if a proper disease management plan is not adapted soon, the prevalence of heart failure will continue to increase along with health care costs. Mongolia needs more public health and clinical researchers addressing heart failure.

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CHAPTER I: LITERATURE REVIEW

Cardiovascular Disease and Heart Failure in the United States and globally

Cardiovascular diseases (CVDs) are one of the biggest public health problems around the world, accounting for almost half of chronic or non-communicable diseases (NCDs). The NCDs have overtaken the prevalence of infectious diseases, and have become the major disease burden in most countries. The CVDs are a large public health issue with a very high rate of morbidity and mortality. According to the World Health Organization (WHO), CVDs account for 17.3 million deaths per year, and this number is expected to grow to >23.6 million by 2030 ("WHO | Global atlas on cardiovascular disease prevention and control," n.d.).

According to Roger et al. (2012), around 5.7 million people in the United States (US) have heart failure (HF) and it was the primary cause of more than 280,000 deaths (1 in 9) in 2008. The overall mortality rate attributed to CVDs was 244.8 per 10,000,000; and is still responsible for 32.8% (811,940) of all deaths in 2008. Even though the morbidity of HF is a serious public health problem in the US, the mortality of CVDs has decreased since 1968, which was the peak of CVD mortality in the US. A decline in CVD mortality was made possible due to a decrease of the major cardiovascular risk factors of tobacco, high cholesterol and blood pressure in the US population. In addition, the innovation of evidence-based treatments of CVDs made an even larger contribution to the decline in CVD prevalence (Ford et al., 2007).

Studies in the US (1980-1990) confirmed that the decline of the main risk factors lowered CVD mortality by 50%, and overall mortality in coronary disease patients by 70% (Hunink et al., 1997). Another study stated that more than half of the decline in ischemic heart disease mortality during 1968-1976 was related to changes of lifestyle and behavior (Goldman & Cook,

1984). Recently it was discovered that the rate of death related to CVDs in the US from 1998 to 2008 declined by 30% (Roger et al., 2012).

Not surprisingly, not only the US has been able to decrease CVD mortality, but other high industrialized countries have managed to do so as well. These decreases range from 44%-76% and included reductions in mortality in countries such as Finland (Vartiainen, Puska, Pekkanen, Tuomilehto, & Jousilahti, 1994 & Laatikainen et al., 2005), the Netherlands (Bots & Grobbee, 1996), Scotland (Capewell, Morrison, & McMurray, 1999), New Zealand (Capewell, Beaglehole, Seddon, & McMurray, 2000 & Beaglehole 1986), England (Unal, Critchley, & Capewell, 2004), and Wales (Unal, Critchley, & Capewell, 2005).

Cardiovascular Disease and Heart Failure in developing countries

According to the WHO, 80% of total CVDs mortality occurs in low and middle income countries. Sufferers of CVD in these countries often have shorter life spans compared to their peers (Smith Jr et al., 2012). A major cardiovascular cause of death is heart failure (HF). HF is a medical condition that decreases ability of heart to pump blood and circulate it throughout the body. The CVDs and HF are even more difficult to manage with limited resources and few evidence based programs, making the consequences of CVD mortality much more devastating in developing countries. As such, people with CVDs and HF in low and middle income countries die younger due to poor health interventions, lack of education and health literacy, and financial restrains.

Non-Communicable Diseases (NCDs), especially CVDs and Heart Failure (HF), are more threatening than they may seem, and also place a huge economic burden on countries around the world. Due to the chronic nature and complications of NCDs, they are long lasting, deteriorating medical conditions that require multiple interventions and continuous health care.

From 2011 to 2025, the estimated financial losses from all NCDs are $7.28 trillion in low and middle income countries. CVDs alone account for about 50% of this projected loss. But if low and middle income countries were able to reduce CVD mortality by 10%, it would result in a $377 billion reduction of financial losses from 2011 to 2025 ("WHO | From burden to 'best buys'," n.d., 2013).

HF may seriously damage developing countries by creating loss of productivity of cardiac patients. It often severely limits a person's ability to work. Loss of productivity hurts not only the individual, but affects the family's income and the country itself by extension. Also, the weakened cardiac patients often need care givers; consequently, a care giver often is a family member and he or she has to stop working in order to nurse a cardiac patient at home. To treat HF and maintain good health in cardiac patients, it is necessary to prescribe several medicines that can be difficult to afford for some people. For the majority of middle and low income families in developing countries, the symptoms of poor health, financial burden, and loss of productivity may result in devastating consequences, which may lead to uncertainty about the family's future.

Sadly, globalization creates unforeseen problems for most middle and low income countries. Adaption of the westernized lifestyle and poor diet of developed countries is spreading worldwide. Limited financial resources and poor structure of health care systems in developing countries creates a barrier in managing the impending global epidemic of chronic diseases. The need for adapting evidence based treatment plans and exemplary public health approaches from successful experiences of other countries should be urgent priorities for middle and low income countries.

Cardiovascular Disease and Heart Failure in Mongolia

It is important to support and help to improve CVDs and HF disease management programs in developing countries. Mongolia is a developing country that is in a transitional period from low to middle income country during the past few years. It is considered one of the fastest developing countries today because of the recent mining boom and export of mineral resources such as coal, copper, and gold. The recent increase in financial resources is creating an enormous opportunity for Mongolians to redevelop outdated internal structures and improve existing systems. The health care sector is one of the fields that needs reform. This paper includes the essential parts of the Mongolian health care system, which will allow the reader to understand its future challenges and strengths. This paper intends to build awareness among Mongolian physicians and health related officials to strive for health care growth and reform.

The limited number of public health surveillance systems in Mongolia makes it difficult to address the prevalence or mortality rate of a specific disease, such as HF. The complete lack of HF data was what brought my attention to this global public health problem. However, there were data available about leading risk factors for HF and data for morbidity and mortality rates of CVDs. Not surprisingly, levels of HF risk factors and CVDs in Mongolia are very high. Even though the prevalence, incidence and mortality of HF were unknown, there was enough data to support that idea that HF prevalence in Mongolia may be a large and increasing problem. Therefore, it is important for Mongolians to promote evidence-based HF disease management approaches, approved by the American Heart Association (AHA) and the Heart Failure Society of America (HFSA). The Mongolian healthcare system has not yet adapted standards of patient education. Neither physician nor nurses are provided with specific training on proper patient education. Therefore a large portion of this paper provides evidence-based methods of HF patient education.

Based on the current public health data and financial burden of HF, this paper addresses possible improvements that can be done in HF disease management and patient education in Mongolia. It is important to adapt the core of evidence-based HF disease management program. This paper will highlight especially the HF patient education approaches which do not require any structural change and are easily adaptable.

Heart Failure risk factors

Unfortunately the HF prevalence, incidence, and mortality rate data is not yet available in Mongolia. There was no data found that specifically addressed HF in Mongolia. Nevertheless, the research addressing the CVDs and HF's main risk factors were found in the report "Mongolian Health Indicator 2011." There is major scientific consensus regarding the positive association of several risk factors with HF, and this section will address those factors. Even though HF data is not available, it is important to use available information to address this public health problem in Mongolia.

HF is a broadly investigated disease because of its burdens. There are numerous studies that prove HF prevalence is positively associated with several risk factors. The very first research that addressed the etiology of this disease was the cohort study that followed individuals for 20 years, the Framingham Heart Study in the 1970s. According to the Framingham Heart Study, HF had several main risk factors. The greatest population attributable risk factor for HF was determined to be hypertension, accounting for 39% of HF cases in men and 59% in women. The second greatest attributable risk factor was myocardial infarction, accounting for 34% of HF in men, and 13% in women. Other important risk factors identified were diabetes mellitus, left ventricular hypertrophy and valvular heart disease (Ho, Pinsky, Kannel, & Levy, 1993). This was the first scientific evidence of HF being associated with behavioral factors.

Another large cohort study was done by first National Health and Nutrition Examination Survey Epidemiologic Follow-up Study (NHANES I), it was also initiated in the 1970s. The cohort study stated that HFs largest independent risk factor was coronary artery disease. In addition, there were other attributable risks such as hypertension, smoking, physical inactivity, overweight, obesity, low educational level, diabetes, and valvular heart disease(He et al., 2001). Other studies showed similar results, confirming HF's association with the above mentioned health conditions, lifestyle choices and behaviors: the main risk factors for CVDs are hypertension, valvular disease, alcohol consumption, tobacco use, diabetes mellitus, dilated cardiomyopathy and systemic heart diseases(Andersson & Waagstein, 1993) (William B. Kannel, 2000).

The causes of HF in elderly and middle aged adults are very similar, except in elderly people HF is more likely to be multifactorial due to greater likelihood of having several long term chronic factors. Certainly the process of aging alone is a strong influencing factor for the development of HF in elderly population. Much of the increased risk is due to lowered immune system defense, slower metabolism, and weaker natural physiological functions of the body, making the elderly more vulnerable. In old people the coronary diseases and hypertension account for more than 70% of CVD cases, making them perfect candidates for HF (William B. Kannel, 2000). This association of HF with old age is one of the key factors that makes HF a very difficult disease to manage.

Even though diabetes was selected as one of the risk factors in Framingham Heart Study, recent studies have shown that diabetes is more influential in contributing to the development of HF than originally believed. Diabetic patients report much higher incidence of HF, accounting for a rate of 31 per 1000 persons a year (Nichols, Gullion, Koro, Ephross, & Brown, 2004),

compared to the Framingham studies' value of 9-14 cases per 1000 diabetic women (Ho et al., 1993). The latest studies showed much higher incidence of HF in diabetic patients and not only in females, but in both genders even when age and ethnicity are controlled for. According to the Heart and Estrogen/progestin Replacement Study (NERS), diabetes was the greatest independent risk factor for the development of HF and coronary artery disease with an adjusted hazard ratio of 3.1 (95% CI:2.3 to 4.2)(Bibbins-Domingo et al., 2004).

Globally, obesity is definitely one of the most concerning risk factors for CVDs and other medical conditions. Overweight and obesity are measured by the body mass index method (BMI, kg/m^2). In the Framingham Heart Study of 5 881 participants, high BMI levels associated with the development of HF by 5% for men and 7% for women(Kenchaiah et al., 2002). A recent prospective cohort study confirmed the positive association of obesity/overweight and HF, with a larger population of 21 094 men. This study stated that the overweight people (BMI 25-29.9 kg/m^2) and obese people (BMI $\geq$30 kg/m^2) were directly and independently associated with increased risk of developing HF, with an adjusted relative risk compared to lean people (BMI < 25kg/m^2) of 1.49 (95% CI: 1.32-1.69) and 2.80 (95% CI: 2.24-3.50)(Kenchaiah, Sesso, & Gaziano, 2009). In addition, not only was the level of BMI was associated with HF, but engaging in physical activity or neglecting to also was associated with HF. The physically inactive, obese men had a higher risk of HF (3.9, 95% CI: 2.6-6.0), and physically inactive overweight men also had a higher risk of HF (1.8, 95% CI: 1.4-2.2), compared to men who were lean and physically active. In addition, physically active obese men (2.7, 95% CI: 2.1-3.5), and physically active overweight men (1.595%, CI: 1.3-1.7), both still had higher relative risks of HF than lean active men (Kenchaiah et al., 2009). From this study, researchers learned that level of BMI is strongly associated with incidence of HF, as is the level of physical activity of people.

It has been proven that lowering risk factors would eventually decrease the probability of developing HF. The majority of HF incidents (90%) are attributable to risk factors such as diabetes, obesity, smoking, blood pressure, and high cholesterol (Folsom, Yamagishi, Hozawa, & Chambless, 2009). By lowering BMI, stopping smoking, keeping cholesterol and blood pressure low, and staying away from other mentioned risk factors, people could potentially be protected from HF, CVDs and other chronic diseases. Knowing risk factors is very important for HF incidence prevention, but they can also be used in controlling HF and CVD disease. Therefore, knowing the prevalence of HF risk factors allows for estimating the prevalence of HF in Mongolia.

It is important to address HF in Mongolia because of the high prevalence of its risk factors. By avoiding these risk factors, average middle age adults are able to decrease HF events by approximately 77% (Folsom, Yamagishi, Hozawa, & Chambless, 2009). Based on this information, Mongolian public health preventive efforts should be directed towards young adults who currently have these risk factors. Community efforts to spread preventive health education and policies supporting to decrease risk factors are urgently needed.

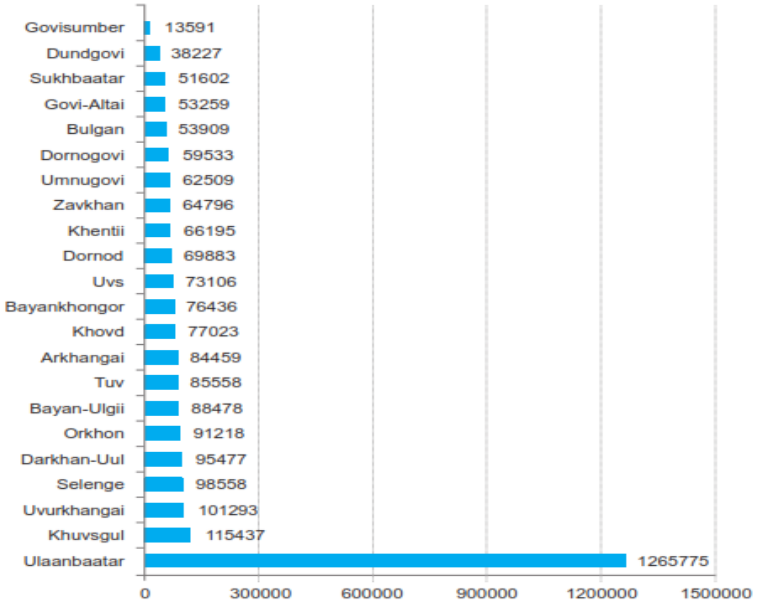
In order to get a sense of HF, CVDs, and other public health issues in Mongolia, I believe it is useful to briefly introduce the Mongolian Health Care System and its structures. Due to the limited public health surveillance data, specifically HF, the below section references the Mongolian government annual report "The Health Indicator 2011" (S.Ariuntuya et al., 2011). This review will suggest that the Mongolia's rural demographic patterns, fragmented health care, and increased prevalence of risk factors make HF a major but preventable cause of death and preventable financial burden on the health care system in a long run.

CHAPTER II: HEALTH SYSTEM AND HEART FAILURE RISK FACTORS IN MONGOLIA

Mongolian health system

Mongolia is located between Russia and China. It covers 1 567 000 $km^{3,}$ and the population reached 2.8 million in 2011. The average life expectancy is 64.68 years in men and 73.76 years in women. Mongolia is divided into 21 aimags (states). Aimags are further divided into a total of 329 sums, which are similar to districts. The capital is Ulaanbaatar city; in 2011, the population of Ulaanbaatar reached 1.26 million, which is 67.07% of the country's total population (Graph 1.). Households residing in urban area have increased by 61.3%, while in rural areas decreased by 4.3% compared to the year 2000. This data supports the increasing migration to the capital city due to socioeconomic differences and availability of jobs, thus creating large health disparities between Mongolians.

Graph 1. 2011 mid-year population divided in aimags **(**Health Indicator Mongolia 2011)



Rural health care

Sum health centers are the first line of healthcare in the countryside. The number of health providers and diversity of health services varies depending on population density and geographical location. Rural citizens may also receive health care in the 37 units of intersum hospitals (hospitals between districts). Unfortunately, many rural hospitals don't meet the national health care standards due to lack of professional preparedness and lack of medical technology. If countryside hospitals are not able to deliver needed care, patients are referred to the capital.

District and Aimag hospitals

There are 8 district urban hospitals and 17 aimag hospitals (state hospitals). Beside physicians and nurses there are 1,027 health care workers who are people trained by the government to assist in health promotion and prevention. Their roles are not very clear, but they would be perfect candidates to perform home visits for HF patients. The bed occupancy in these hospitals is increasing rapidly due to the centralization of population in urban centers and increasing prevalence of chronic diseases.

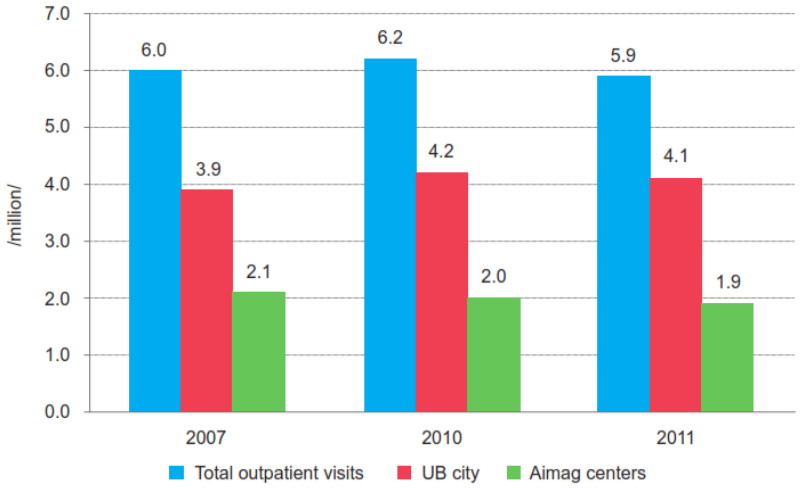
Urban health care

The increasing trend of overpopulation in the capital is directly associated with the rising demand for healthcare services. In the Ulaanbaatar (UB) city the number of outpatient visits from 2005 to 2011 increased from 3 million to 4.1 million visits per year. The number of medical examinations per visit in Ulaanbaatar, 8198.4, was far greater than in the visits in rural sums, 1740. This difference shows shifting health demand and supply rural to urban areas (Graph 2.).

Family health care centers and primary care

As of 2011, there were 219 family health care centers (urban), and 274 sum (rural districts) health centers providing primary health care. These urban family health care centers are privately owned organization contracted by the government to deliver primary health care to the urban community established in 2002. 124 units provide medical care and public health services to the citizens of the capital city, Ulaanbaatar. In 2011, family health care centers provided health services for 5.9 million outpatient visits, with an average of 3.2 visits per year per person (Graph 2.). Of those visits, health preventive examinations made up 42% of family health care centers in Ulaanbaatar, and 31.8% in rural aimag centers.

Graph 2. Total number of outpatient visits to family health care centers in 2011 (Health Indicator Mongolia 2011)



Private hospitals

The size and other specific details of the general hospitals depend on the present demand and needs of the society in that region. Most of the privately owned hospitals are located in the capital, and have the best medical equipment and a better inpatient environment compared to government hospitals. But due to the limited number of highly trained doctors in Mongolia, efficient human resource planning is a tough challenge for the private sector.

Central hospitals

In Mongolia there are 6 central hospitals providing the third tier of care. Central hospitals have highly skilled doctors, providing the broadest range of medical attention in Mongolia. These hospitals receive 21.1% of total hospital beds and admit approximately 19.8% of inpatients from the national total admissions. The problem is there are always many more patients heading to the third tier hospitals because patients are not satisfied with the service provided in the primary care. The system of referral does not work efficiently, because third level hospitals provide variety of outpatient services for fee. The ill patients prefer to go to the third tier hospitals, where they will be attended by a highly trained specialist with experience. From the total number of 134,000 patients admitted to the central hospitals, 25.2% of them were referred from lower tier. Even though there was an increase of referrals from lower level hospitals by 13.1% compared to 2009, it still shows the system of hospital and patient administration and referrals needs to be improved.

Inpatient length of stay and payments

The 2011 health indicator report showed the average length of stay in a district general hospital was 7.9 days per patient. The average length of stay in aimag general hospitals was 8.1 day per patient. In addition, the length of stay in the capital's third level general hospitals was 10 days (Table 1.), which was greater than both district and aimag hospitals. The average 10 days of inpatients in Mongolia is very high compared to the US hospital's average length of stay which is 4.8 days ("Surveys and Data Collection Systems Homepage," n.d.). The reason for the prolonged average length of inpatient stay is the inadequate payment system. According to the health care laws, the patient pays only a portion of total inpatient medical care expenses, with a fixed amount of payment for all inpatient stay. The payment mechanism leads to inadequate

information about the care received in the hospital; such knowledge could be crucial for designing the HF program. The rest of the payments are covered by government national health insurance, and the government.

Table 1. Central hospital and specialized care centers accessibility and quality indicators (Health Indicator Mongolia 2011)

Indicators	Years			Average for the last 3 years
	2009	2010	2011	
Number of hospital beds	4005	3995	3995	3998.3
Number of physicians	1183	1207	1280	1223.3
Number of nurses	1875	1866	1937	1892.7
Average length of stay	10.2	10.0	9.9	10.0
Percentage of death occurred within 24 hours	19.8	23.5	21.2	21.5
Number of in-patients	131068	135248	137929	134748.3
Number of out-patients	1191925	1187610	1200639	1193391.3
Number of in-patients referred from lower level of care (from rural areas)	30727	33622	34741	33030.0

In addition, Mongolian hospitals don't have an appropriate patient discharge process. After treating patients at hospitals, health providers do not provide formal patient education, neither patient discharge sheet. The current discharge process consists mainly of brief chat with the health provider. The physicians answer the patient's questions, and give recommendations orally. Without being provided formal patient education nor written educational material and discharge sheet, patients often leave the hospital without an appropriate understanding of the disease and their expected behavior. Therefore, the development of formal patient discharge system can improve significantly the patient outcome.

Heart Failure risk factors in Mongolia

By analyzing the prevalence of risk factors of HF in Mongolia, it allows us to deduce that heart failure is prevalent despite a lack of official data. The following section discusses the alarming rates of HF risk factors in Mongolia such as: tobacco use, alcohol use, low

consumption of fruits and vegetables, low physical activity, air pollution, diabetes, hypertension and ischemic heart disease.

Tobacco

According to the Health Indicator Mongolia 2011, since 2005 the prevalence of tobacco users increased from 25.9% to 27.6%. According to "The Tobacco Atlas, 2012," written by Prof. Michael Eriksen, 40-49.9% of Mongolian men are smokers; 40-59.9% of youth live in homes where others smoke in their presence; and 70-75.9% of male teenagers (ages 13-15) consume cigarettes (Eriksen, Mackay, & Ross, 2012). Unfortunately, the prevalence of chronic smokers among men is very high and a new generation of teenagers is quickly adapting this habit.

Alcohol

The regular use of alcohol increased from 30.5% in 2005 to 38.60% in 2009. According to Alessandro R. D. (2013), 50% of men and 30% of women were found to be current drinkers of alcohol (Demaio et al., 2013). Due to the increasing stress produced by socio economic factors and unemployment in the community, alcohol consumption is very high among adults and it is rapidly increasing among teenagers. Unfortunately, in Mongolia most leaders of the alcohol industries have strong connections in the high level politics and the Mongolian parliament, which makes it more difficult to fight against alcohol abuse.

Consumption of fruits and vegetables

Mongolian weather does not allow growing different types of fruits and vegetables, because of the extreme cold (-40'C or -40'F) winter and hot (+37'C or 99'F) summer seasons. Therefore an average Mongolian consumes fewer fresh fruits and green vegetables, but more meat and flour compared to citizens from developed countries. The recorded intake of fruits by the national survey showed would Mongolians consume fruit on only 1.6 days of the week in

2005, and this amount was reduced to 1.2 days of the week in 2009. The prevalence of people who consume more than two servings of vegetables per day accounted for 44.4% of population in 2005, and decreased to 29.7% in 2009. An unhealthy diet is positively associated with the prevalence of obesity, diabetes, and other NCDs. This allows us to assume that low consumption of fruits and vegetable is contributing to the prevalence of HF in Mongolia.

Physical activity

People with active lifestyles who exercised on a regular basis (30 mins minimum per day), accounted for 15.4% of the population in 2005, and this number decreased to 11.7% of the total population in 2009. I found it impractical to try to estimate an average amount of physical activity for Mongolians because of the life style differences in urban and rural areas. Most herders and other people from rural areas live in a completely rural environment and are involved in much more daily physical activity than urban residents, such as carrying drinking water from local wells, and preparing fire wood for cooking purposes. The urban residents have adapted the westernized sedentary life style. Therefore, the average of the above mentioned two lifestyles would not be an accurate description of the average physical activity of an average Mongolian. Therefore, this topic is highly recommended for further research in the future. Nevertheless, the available data estimated that in 15.4% of Mongolians in 2005 and 11.7% of Mongolians in 2009, average physical activity is low and on the decline, thus becoming a major risk factor for HF and other NCDs.

Obesity

Researchers reporting the prevalence of obesity, abdominal obesity and body fat among 408 Mongolian adults aged 25 years and above, included 61.2% from urban areas and 38.8% from rural areas. According to the results, about one-third (32.8%) of the subjects were

overweight and 10.5% obese. In addition, the prevalence of abdominal obesity was found to be 46.5% in the men and in 65.1% of the women. The author stated that Mongolian adults face a serious risk of cardiovascular diseases and other health issues because of the high rate of obesity (Otgontuya, Khor, Lye, & Norhaizan, 2009).

Diabetes

According to the available data, diabetes accounted for 0.6% of all reported cases of non-communicable diseases in Mongolia. The incidence rate of diabetes was 36.7 per 10,000 population, which increased by7.3 per 10,000 compared to the previous year (29.4 in 2010), with minimal difference in gender. The population of 45-65 years olds with diabetes increased to 23.6 cases in one year, reaching 141.4 cases per 10,000. The rural area population showed the lowest prevalence of diabetes by 5.9 cases, but diabetes incidence was the highest in rural areas. Thus diabetes mellitus is a becoming a major public health problem in rural and urban Mongolia, with an incidence of 10,222 cases in 2011. It is important to remember that the prevalence of diabetes is directly associated with the prevalence of HF (Ho et al., 1993).

Hypertension and ischemic disease

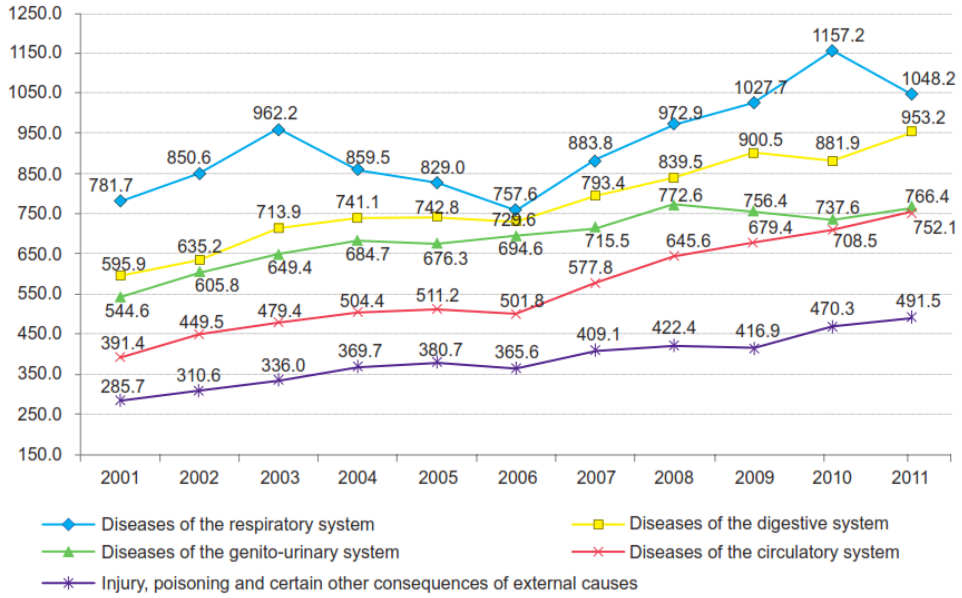
Hypertension makes up 3.8% of all non-communicable diseases in Mongolia. The incidence rate was 311.8 cases per 10,000 populations. The data supported that the incidence in rural areas was higher than in urban areas by 278.2 cases. In 2011, the number of new CVD cases diagnosed reached 209,550 cases and accounted for 6,291 deaths. Hypertension accounted for the largest incidence with 15,726 cases, and 444 deaths. The second largest disease was ischemic heart disease with 47,906 cases, which accounted for 1,620 deaths. Other cases included rheumatic fever and rheumatic heart diseases, cerebrovascular diseases, and acute myocardial infarctions. The available CVD data proves that circulatory diseases are one of major

health issues in Mongolia, and that HF should be addressed as a potential major contributor to this rising public health problem in Mongolia.

Cardiovascular diseases in Mongolia

As of 2011, the circulatory diseases were the fourth most common non-communicable disease in Mongolia. The prevalence of cardiovascular system diseases accounted for 752.07 cases per 10,000 populations in Mongolia, and is still increasing (Graph 3.). From the nationwide hospital inpatient health service data, cardiovascular diseases were found to be the second leading causes of morbidity that were treated at hospitals.

Graph 3. Five leading causes of morbidity in Mongolia, per 10,000 population /2001-2011/ (Mongolian Health Indicator 2011)



CVDs are one of the five leading causes of hospitalizations since 2000. The most common causes of hospitalization are hypertension (34.7%) and ischemic heart disease (19.2%). In 2011, the inpatient prevalence of hypertension increased to 36.8% and ischemic heart diseases increased to 26%.

CVDs mortality rate

Since 1995, the three leading causes of death in Mongolia have been cardiovascular diseases, neoplasms and injuries. In Mongolia, circulatory system diseases are the number one cause of all mortality in both sexes. CVD alone accounted for 36.7% of all deaths. CVD is an alarming public health issue in Mongolia, the number of deaths due to CVD is almost as much as the number of the cancer and injuries combined. An average of 6000-6500 people (or one third of total mortality) die due to CVD. The seniors 65 years of age and older were the most affected age group, and adults aged 45-65 years were the next high age group for CVD mortality in Mongolia. In 2011, 17,124 deaths were registered nationwide, which was an increase by 143 cases or 0.9% from the last year's statistics. 24.5% of total deaths or 4,176, occurred in hospitals, of which 26% occurred within 24 hours of admission.

Even though there is lack of data on the specific cause of CVD mortality in hospitals, HF is a potential major cause of mortality and a major attributor to the CVDs morbidity. Due to its potential burden on the society and health care finance, HF should be further investigated extensively. The above mentioned health conditions and potential risk factors are major issues of the past and present of Mongolia. The alarming level of mortality of CVDs should encourage Mongolians to adapt better approaches of disease treatment, management, and prevention programs. The morbidity and mortality of CVDs are rising, but HF is not addressed at all in any existing literature in Mongolia. Therefore, HF must be investigated, and Mongolian health policy makers are strongly encouraged to develop an evidence-based approach to deal with this global public health issue.

CHAPTER III: PROPOSED HEART FAILURE DISEASE MANAGEMENT IN MONGOLIA

Evidence on Heart Failure disease management program

HF disease management programs can reduce hospitalizations and improve patient's quality of life. This supposition is supported by numerous studies demonstrating the effectiveness of disease management programs in terms of positive outcomes for HF patients in the US and other countries.

Health education and patient's self-management support will not only bring a significant improvement to a patient's quality of life, but they are one of the most cost effective ways to deal with this situation. For HF patients it is very common to improve significantly in the hospital under doctor's supervision, but after being discharged their health deteriorates and re-hospitalization is very common. HF changes a patient's daily lifestyle and it is difficult for them to comply with a doctor's recommendations, especially without any support. Therefore, patient's self-management support is an important factor that correlates with the success of HF management.

A large study was conducted at the American Veterans Affairs medical center to prove the effectiveness of HF disease management programs in large populations. There 969 veterans with HF in total; 458 received the HF program (intervention group) and 511 received the usual care (control). The intervention group showed significantly fewer ($p<0.05$) HF complications and fewer all cause admissions at one year follow up, and lower mortality through the 2 year follow up (Lowery et al., 2012). Another US study with 88 HF patients (44 in intervention and 44 in control) also reported patient improvement in a HF disease management program with a 39% decrease in total number of readmissions (Krumholz et al., 2002). The intervention group

showed significantly lower risk of readmission compared with the control group (hazard ratio = 0.56, 95% CI: 0.32, 0.96; p = 0.03). Krumholz concluded that providing health education and supporting HF disease programs significantly reduces the adverse clinical outcomes and cost for HF patients.

Australian researchers also agree with the benefits of HF disease management programs. Steward, Simon, and Horowitz (2002) conducted a 4.2 years cohort study (N=297) that focused on the effectiveness of home based HF interventions. Results confirmed that home based interventions had 78 fewer unplanned readmissions compared to usual care (0.17 compared 0.29 readmissions per patient per month; $p<0.05$); the median cost for intervention patient was $325 compared to usual care patient $660 per month(Simon Stewart & Horowitz, 2002).

In Ireland, researchers also conducted a study comparing two groups of HF patients. In the first group patients received inpatient and outpatient education sessions with telephone calls or clinic follow up, but second group received the usual care. The results not surprisingly were similar to the previous HF researchers from other countries. At 3 months after discharge from the first group four people had events (7.8% rate) compared to the second group with only 12 people (25.5% rate) , with P=0.04. This data showed that HF disease management program is positively associated with lower risk of HF complications after being discharged (McDonald et al., 2002).

Some authors estimate that 50% of emergency department patients with HF could be safely discharged after a brief period of observation, avoiding unnecessary admissions and minimizing readmissions (Collins et al., 2013). Creating observational unit management may be ideal for low risk and intermediate risk patients with HF that require only symptomatic treatment(Collins et al., 2010). According to Collins, most patients are most often admitted because of the uncertainty regarding post discharge events, therefore, large number of these

admissions could be avoided yet patients could still receive timely and effective care. If HF patients come to the emergency department because of failure to control symptoms of the disease, the HF patient must be provided with HF disease instructions and education specifically designed for the average educated person.

According to the Heart Failure Society of America (HFSA) (Lindenfeld et al., 2010), the modifiable factors leading to hospital readmissions for HF are:

- Inadequate patient and family or caregiver education and counseling
- Poor communication and coordination of care among health care providers
- Inadequate discharge planning
- Failure to organize adequate follow-up care
- Clinician failure to emphasize non pharmacologic aspects of HF care, such as dietary, activity, and symptom monitoring recommendations
- Failure to address the multiple and complex medical, behavioral, psychosocial, environmental, and financial issues that complicate care, such as older age, presence of multiple comorbidities, lack of social support or social isolation, failure of existing social support systems, functional or cognitive impairments, poverty, presence of anxiety or depression
- Failure of clinicians to use evidence-based practice and follow published guidelines in the prescription of pharmacologic and non-pharmacologic therapy

In summary, the main components of HF programs shown to be effective are:

- Developing a HF multidisciplinary team
- Improving health worker's decision making

- Developing inpatient and outpatient education session and material
- Providing patient discharge instructions
- Improving patient's health access
- Monitoring HF patients after hospital discharge.

Proposed Heart Failure disease management program in Mongolia

It is known that adapting HF disease management program improve patient's health, decreases post-discharge complications, and reduces patient's health cost. Many countries and hospitals have developed their own versions of HF programs, and many patients benefit from these programs. Unfortunately, the current approach of treating HF in Mongolia does not involve evidence based formal disease management programs for HF. Currently, the focus is on improving clinical symptoms during the hospitalization period and providing short term pharmaceutical therapies, rather than improving post discharge outcomes.

Therefore, I am proposing to develop a HF disease management program in Mongolia. The proposed HF program is expected to improve the quality of patient's care, decrease HF readmissions, reduce the HF patient's cost, lower HF (CVDs) mortality, improve hospital care, increase health education, and support patient's self-management. The effectiveness of HF disease management program greatly depends on the use of evidence based approaches, facilitation of culturally acceptable and feasible methodologies, science-based self-care behaviors, and effectiveness of the health care system. The health literacy level, lifestyle, beliefs and local culture are important factors to consider. Therefore, the HF disease management program increases adherence to both pharmacological and non-pharmacological approaches to control HF symptoms after hospital discharge.

Recommendations for Heart Failure patient education and self-management

The patient and family members perform the majority of HF care at home. Understanding the importance of every prescribed medicinal and behavioral recommendation is important. If the individual fails to understand, or doesn't clearly see what is required and for what reason, he/she will fail to self-manage HF. Proper patient education can help patients to better self-manage after hospital discharge. That is why comprehensive education and counseling are the essential for HF management. The goal of HF education is to help patients and family members to acquire appropriate knowledge, skills, strategies, problem solving abilities and motivation. The best source of recommendations is found from the Heart Failure Society of America (HFSA). See Table 2.

Table 2. Essential Elements of Patient Education with Associated Skills and Target Behaviors (HFSA 2010 Comprehensive Heart Failure Practice Guideline.)

Elements of education	Skill building and critical target behaviors
Definition of HF (linking disease, symptoms, and treatment) and cause of patient's HF	- Discuss basic HF information, cause of patient's HF, and how symptoms relate to HF status
Recognition of escalating symptoms and concrete plan for response to particular symptoms	- Identify specific signs and symptoms (eg, increasing fatigue or shortness of breath with usual activities, dyspnea at rest, nocturnal dyspnea or orthopnea, edema) - Perform daily weights and know how to respond to evidence of volume overload

	- Develop action plan for how and when to notify the provider, changes to make in diet, fluid and diuretics
Indications and use of each medication	- Reiterate medication dosing schedule, basic reason for specific medications, and what to do if a dose is missed
Modify risks for HF progression	- Smoking cessation - Maintain blood pressure in target range - Maintain normal HgA1c, if diabetic - Maintain specific body weight
Specific diet recommendations: individualized low-sodium diet; recommendation for alcohol intake	- Understand and comply with sodium restriction - Demonstrate how to read a food label to check sodium amount per serving and sort foods into high- and low-sodium groups - Reiterate limits for alcohol consumption or need for abstinence if history of alcohol abuse
Specific activity/exercise recommendations	- Comply with prescribed exercise
Importance of treatment adherence and behavioral strategies to promote	- Plan and use a medication system that promotes routine adherence - Plan for refills

Self-management

According to the HF guidelines developed by Heart Failure Society of America (HFSA), self-care is an important part of HF management, which involves active participation of the HF patient and family members or care giver. It can be seen two different ways: health maintenance and health management (Lindenfeld et al., 2010). Health maintenance includes:

- Healthy life style decisions (e.g. exercising, maintaining a normal body weight and etc...)
- Treatment adherence and management (e.g. monitoring weight changes, limiting dietary sodium, taking prescribed medications, getting routine immunizations and etc…)

Self-care management is a cognitive process that allows patients to recognize signs and symptoms, evaluate their importance, implement a self-care treatment strategy, and evaluate the effectiveness. Lack of knowledge about HF and its methods/strategies to better self-manage can lead to a lack of adherence to a prescribed treatment plan, making HF patients more vulnerable to deterioration of their health condition. The HF health education is a critical component of HF disease management programs.

The HF guideline of HFSA also emphasizes developing a patient's skill for self-management, because knowledge alone is not sufficient. Those skills include the ability to read food labels, adapt preferred food to low sodium versions, choose low sodium food options from stores, prepare food with little or no sodium, track sodium intake, and choose a low sodium meal at restaurants. Other necessary skills are medication adherence, symptom management skills (ability to monitor and recognize significant change in signs or symptoms and control with appropriate treatment strategy), and self-directed diuretics scheme for managing significant increases in body weight (Lindenfeld et al., 2010).

The American Heart Association (AHA) clarified that several behavioral patterns are

most important in self-management, these are: adherence to prescribed medication, diet and exercise, symptoms and weight monitoring, fluid and alcohol restrictions, smoking cessation, informing the doctor of any other non-prescribed medication they have taken including complimentary therapies, and incorporating preventable behaviors in their lifestyle such as regular dental care (Riegel et al., 2009). The above mentioned recommendations from AHA were developed to ensure success in a HF patient's self-management and decision making. Patient adherence to a doctor's recommendation is difficult to enforce because of certain barriers. Riegel and Carlson (2002) discovered that those barriers consist of lack of understanding of HF and its symptoms, complex treatment regimes, and limitation in undertaking activities of daily living and emotional wellbeing (Barbara Riegel & Carlson, 2002). The participants of this study acknowledged that the biggest problem was that they don't have a sufficient understanding about HF. However, Carlson, Riegel, and Moser (2001) found that individuals with HF improve their knowledge of the disease and self-management through experience. The experience of being ill and having to go through multiple HF interventions certainly aids patients in learning more about their medical condition and better self-care methods. These results also showed that the health education was provided poorly and inefficiently.

Patient education

The educational sessions should begin with an assessment of the patient's current HF knowledge, focusing on issues that the patient is interested in learning, as well as their barriers. Each patient needs individualized counseling and education planning based on their prior knowledge and experience by providing feedback and reinforcement.

Besides common barriers, it is important to consider the patient's readiness to change. Health education is effective only if the individual finds the information important. Once the

patient finds health education useful, only then he/she may decide to actively participate according to the treatment plan. But many patients are not ready to change their behavior suddenly. According to one of the many existing models, patients can be divided in 4 phases (Prochaska, DiClemente, & Norcross, 1992):

1. Pre-contemplation: patients don't consider change at all
2. Contemplation: patients think about change but yet to make a commitment
3. Preparation: patients plan to change in the future and may have already engaged in some early steps of change
4. Maintenance: patients are changing (in action) or are maintaining their change for 6 months or more

Health providers should keep in mind that increasing a patient's motivation is the most promising method to influence patient's decisions. This method is effective from the earliest stage to the active stage of change. Specific techniques and different emphases are needed in education planning depending on patient readiness and stages of change (Saarmann, Daugherty, & Riegel, 2000). For example, education provided to patients considering a change will be most effective if they receive more information about their health condition. But patients who are in the contemplation stage have enough information and find more information irritating; yet, they might respond to education where potential benefits are emphasized. Patients who are in the preparation stage would respond to the comments and feedback that increase their level of confidence, focusing on techniques to build their self-management ability. The health education method of approach and emphasized topics is most effective if patients get individual assessment and delivery technique.

Health providers also should keep in mind that provoking fear and coercion result in inefficiency. Research showed that if people feel pushed for to change it causes personal resistance to not change, even if it is for their own sake (Saarmann et al., 2000). Similar approaches, such as dictating decisions to patients or making decisions on behalf of them, are rarely considered effective in the long term because personal reasoning and ownership over his/her decisions are essential (Lindenfeld et al., 2010).

The HFSA recommends that the frequency and intensity of HF education and counseling vary according to the patient's health condition. Patients with advanced HF or with persistent difficulty in adhering to recommendations require more education and counseling compared to others. Surprisingly, the researchers found that when patients with few symptoms, or less complicated HF, received intensive counseling they show negative outcomes in terms of use of health resource, cost, and quality of life (B Riegel, Carlson, Glaser, & Hoagland, 2000). Patients with severe HF conditions have the most benefit from intensive and frequent educational sessions. The educational planning is important; during the acute care hospitalization only the essential HF information should be provided. The goal is to aid patients in understanding HF, the goal of the patient's treatment, the post hospitalization medication, recommendations and follow up regimen. The education started during the hospitalization period should be enriched and provided again within 1-2 weeks after discharge, and continued for 3-6 months (Lindenfeld et al., 2010).

Including family members in the HF patient's health education is very important. The need to change his/her traditional lifestyle and physical limitations are the biggest reasons for depression and stress. Mental and emotional state can directly contribute to the HF patient's health outcome and self-management. Providing health education to family members allows

them to learn of the patient's condition, helping to create a supportive and stress free environment at home. Cognitive impairment, functional disabilities, multiple comorbidities and other conditions may limit their ability to fully comprehend, appreciate, or enact what they learn (Moser & Watkins, 2008). Creating a positive, stress free environment at HF patient's residence is important.

According to Clark and Lan (2004), patients found that HF signature symptoms were the most important information to learn. Because the appearance of certain symptoms allowed patients to realize their health deterioration and allowed precautionary actions to be taken, in some cases even preventing death. In addition, the evidence showed that the symptoms of HF are more important to learn than information about diet control, physical activity, and other psychological topics (J. C. Clark & Lan, 2004). Patients were more concerned in knowing what to steps to follow when their health deteriorates, rather than knowing the prevention of HF symptoms. Therefore, Mongolian health educators are encouraged to develop contents covering the patient's personal interests and it is very important allow them to show their personal concerns.

The HF patient's education about prescribed pharmaceutical medications are considered one of the most critical pieces of information. It is essential for patients to understand the function of the medication rather than just memorizing names and dose. HF patients need to understand that medications such as beta-blockers and angiotensin converting enzymes inhibitors are prescribed to control blood pressure, but not to "keep their heart from failing." If a patient doesn't fully comprehend the reasons why these medications were prescribed, for instance, he or she may take a beta blocker even when their blood pressure is low, failing to understand that it was prescribed to lower the high blood pressure. Therefore, health educators must clearly

communicate the purpose of prescribed medicines, allowing patients to familiarize themselves with each prescribed medicine.

Other evidence suggests that motivated patients can learn and change their behavior significantly by receiving distance counseling such as telephone calls, mail, or through other technology; but this effectiveness was negated in those with cognitive impairment, depression, low literacy level, poor social support, and low socio-economic status (Strömberg, Ahlén, Fridlund, & Dahlström, 2002). Therefore, health providers should keep in mind evaluating every HF patient to determine which educational approach would be most beneficial and affordable on an individual basis. But regardless of what method is used, it is encouraged to cover the educational material in more than one way (e.g. verbal with written materials).

Patient knowledge test

After providing health education it is important to test patient's knowledge. To make sure that the educational session is effective, health providers are recommended to ask patients to demonstrate their knowledge about:

- The name, dose and purpose of each medication
- Be able to sort foods into high and low sodium categories
- Demonstrate their preferred method for tracking medication dosing
- Show the provider a daily weight log; repeat symptoms of worsening HF
- Knowing when to call the health provider because of specific symptoms or weight changes

The patient's knowledge test is important because health provider's time and effort in patient education should be evaluated for effectiveness. Providing health education is effectively delivering needed information. It is important to make sure that the patients have fully

comprehended the provided materials, and patients should feel confident to implement these recommendations. The best way to confirm patient's knowledge is by asking the patients verbal and written questions and also by asking patients to demonstrate what they have understood. This allows patients to fully comprehend and retain the HF information. Adapting the questionnaire session into the HF education planning may take additional time for health providers; but without this session the effectiveness of provided education is questionable. In addition, it would help patients to retain the newly acquired knowledge, and patients may experience additional benefit from the health educational program.

Finally, HF patients often find themselves with restrictions that limit daily activities. The most difficult restriction was changing diet, because this is one of the few pleasures left after being diagnosed with HF. That is why it is very difficult for patients to comply with dietary restrictions. Therefore, health providers should attempt suggesting creative solutions on how to maintain their dietary compliance, rather than just providing facts and restrictions. Due to the fact that fruits and vegetables are very expensive in Mongolia, the health providers and educators are advised to put more focus on the dairy products. Mongolians have more ability to increase the consumption of dairy products, because in Mongolia there are still a great number of herders that produce numerous traditional dairy products from their cattle.

Proposed HF education delivery system

A hospital's environment and patient's emotional state can influence the patient's education efficiency. In the hospital's environment it is difficult to learn and retain any new information because patient's and family member's minds are more likely to be worrying and anxious (Horan et al., 2000). There were studies that showed that 46% of patients were not compliant after recent discharge, particularly demonstrating low accuracy in medication related

knowledge (S Stewart & Pearson, 1999). Another study found that half of all patients interviewed said that they didn't receive any medication related education before discharge; 70% claimed that they didn't receive written materials; and only 43% were able to name their prescribed medications. No one knew side effects of their prescribed medications (Alibhai, Han, & Naglie, 1999). Lessons learned from this research were that the medication regimen aspect of health education must be confirmed by patient's responses, and health education should be reinforced and additional teaching started within one week of discharge. In addition, health education and counseling should be undertaken as a systematic educational approach that continues for 3-6 months according to the needs of the patient and family (Barbara Riegel et al., 2002).

To implement a HF disease management program and HF patient education it is important to form HF multidisciplinary teams within departments. The team should consist of trained HF physicians, nurses and other health workers. Forming HF teams allow patients to receive the best care, provide more efficient education, help them in self-management and prevent re-hospitalizations. Training physicians allow them to be better prepared in managing HF patients, and develop up to date, evidence-based individual patient treatment plans. The effectiveness of the program directly depends on HF physician's preparation. It is also important to train nurses to become specialized "HF nurses" because they are the front line health providers, working closely with patients on a daily basis. The HF nurses act accord to each patient's individual treatment plan guided by HF clinicians. In order to ensure the efficiency of the HF team work, it is highly advised to have HF "champion" nurses (or clinicians): leader nurses (clinicians) who volunteer to become HF nurses (clinicians) and show other nurses (clinicians) exemplary HF care. The spectrum of responsibilities of HF nurses would range from

prevention, palliation and health education, depending on the patient's condition. Other health related workers can be part of the team: HF pharmacists are recommended; their role is important especially in providing options for pharmaceutical treatment plans and ensuring the most appropriate choices depending on the patient's personal concerns. In Mongolia including pharmacists is encouraged, but not necessary. The pharmacists lack a legal environment to prescribe medicines. Because pharmacists don't need to prescribe medications, patients are not required to bring prescriptions to buy any medicine from pharmacies. Therefore, a pharmacist's role may not be received seriously by patients and also some health providers.

In addition, the evidence shows that the HF patients and their family members should receive individualized education and counseling delivered by nurses and supplemented by physicians. Even though HF nurses deliver the health education and the patient's knowledge is tested, HF clinicians are encouraged to approach patients for any doubts that they may have. Depending on the availability, the contributions of nutritionists, health workers, and other health volunteers are encouraged for extra health education after being discharged. It is also known that teaching is not sufficient without skill building and counseling after hospital discharge. The Mongolian health workers and volunteers may contribute greatly in helping patients in self-management and continuing HF education at home.

The availability of patient's medical history is important, but in Mongolia it can be a challenge. Globally, the most preferable method of information sharing has become electronic medical record (EMR) systems in hospitals. But unfortunately these are expensive systems Mongolia cannot yet afford. Currently, Mongolian doctors use the traditional method of a patient's personal clinical history hand written on paper, which is carried by the patient every time he/she sees a doctor. The most commonly encountered problem with this type of medical

history is the difficulty of maintaining a complete medical history over a long period, including the loss of medical records or keeping more than one. As a consequence, doctors often have to rely on oral medical history provided by the patient or his/her family. The bad hand writing of different physicians is also a problem, making it difficult to read for others. Lack of commonly followed standards on patient's medical visits is also an issue. As a consequence, there is a possibility of incomplete information provided from one visit to the next. Therefore, I am proposing to develop a standard writing scheme for HF patients, with well-structured information about their medical condition and previous visits. Standardization of HF patient's medical history writing order may help physicians to provide more specific and effective treatment plan.

Providing discharge instructions to patients and family members is very important. Even though discharge instructions can be very different, here is one example. These discharge instructions were originally taken from that Grady Memorial Hospital's version, and was adapted with some changes.

CHAPTER IV: CONCLUSION

The implementation plan in Mongolia

Currently there are many issues with the Mongolian health care system addressed in previous sections. From all of those problems, I chose this topic because it seemed most feasible to implement in Mongolia. Because of an existing personal contact with Mongolian cardiologists at the 1st central hospital in Ulaanbaatar, I will be able to implement the primary version of this HF disease management program and patient education in the Cardiology department. Local stakeholders are hospital management and leader cardiologists. They have showed their interest in implementing this evidence-based disease management plan and patient education. After further discussing with key stakeholders and champion cardiologists, we agreed to develop the most efficient and feasible model that can be adapted easily in Mongolian hospitals and further throughout the health care system.

In addition to applying this program in the "1st central hospital", my plan is to do research based on pre and post intervention data accumulated from the hospital's patient's data archive. This will hopefully discover the effects of this program by comparing pre and post HF patient re-hospitalization data. The key measures would focus on improvements of re-hospitalization and patient's quality of life triggered by the implementation of this program. In case of positive associations in the results of this program, we will have an opportunity to publish findings and propose it to the stakeholders at the Health of Ministry of Mongolia. If the program shows promising results we would partner with the Ministry and hopefully apply this program to other health care centers and hospitals, making it a part of national NCDs management program in the future.

Challenges

The possible challenges in implementation of this program are: lack of some local physician's support, health care workers refusing to adapt the new approach, Mongolian geological characteristics, discrepancy of urban and rural areas, the inefficient health care system, gaps in socioeconomic status, inequality in patient's education, and limited health care access.

The current traditional health system will be a huge barrier in adapting similar programs. Inefficient payment system, low salary of physicians, and lack of transparency in the hospitals' environments will delay people striving for adapting new disease management programs at hospitals. In addition, local health providers might not agree with the proposed plan and refuse to participate in such innovative changes. Hopefully, support of hospital administration, champion doctors, and nurses will help this program to advance and be adapted successfully in health care settings of Mongolia. However, it is evident that the Mongolian health care system is no longer functioning effectively for neither for health workers nor the people therefore I strongly encourage health care reform when the timing is right.

The discrepancy existing between the rural and urban areas in Mongolia is large. It includes the discrepancies in: monthly earning, health access, education, economic, social and environmental factors. Because of these large gaps in discrepancies, this program will face some barriers in adapting this kind of programs. Nevertheless, an improvement of primary care access is necessary; the content of evidence-based proper health education packages must be developed and provided to HF patients regardless.

Clark et al. (2007) observed low obedience to doctor's HF guidelines, issues with diagnostics, and issues with the implementation of interventions in rural communities compared

to urban areas. It is evident that in rural areas with limited health care access and health discrepancies, it is much more difficult to provide efficient care to HF patients and to support self-management after discharge. Therefore, the HF disease management program and proper health education standards must be developed and applied in practice in Mongolia as soon as possible.

The health educational sessions should be developed on individual basis, depending on the patient's literacy level, cognitive status, psychological state, culture, and access to social and financial resources. Patients should be screened for cognitive impairment and depression, because these can interfere with learning. Even though low literacy is not a problem for Mongolians, the discrepancy in social, economic and environmental factors is very large. Health providers should keep in mind that physical, cognitive, social, and environmental factors can affect the efficiency of educational sessions. Cognitive impairment is the most prevalent problem in HF patients and can affect significantly the patient's ability to learn and retain information (Bennett & Sauvé, 2003 & Zuccalà et al., 2003).

Another well-known barrier to HF disease management program is depression, and it is astrong predictor of mortality for HF patients. According to an article written by Tiny Jaarsma, identification of depressive symptoms before enrollment in a disease management program might lead more effective use of the program because depressive patients might not benefit from a general program (Jaarsma et al., 2010). Unfortunately, the treatment for depression seems not to improve outcomes; therefore, patients with cognitive impairment and depression need more support and assistance of family member or caregivers at home (Lindenfeld et al., 2010). The depression and cognitive impairment is often encountered in low socio-economic areas; this might become a barrier for those HF patients who live in rural or lower income districts of

Mongolia. Putting more resources towards and providing more assistance for this group of people will be a challenge for a country with limited resources.

HF patients often encounter several barriers that are the main reasons of patient's unsuccessful self-management. Health providers should keep in mind that barriers in medication adherence are: high medication cost, transportation to the pharmacy or health clinics and confusion among prescribed drugs (S Stewart & Pearson, 1999). Barriers on sodium restriction adherence include time, cost, taste, others not eating low sodium food, interference with social-cultural norms or traditional food options, difficulty changing diet habits and etc… (Happ, Naylor, & Roe-Prior, 1997)

Conclusion

This paper discussed numerous evidences that support preventing and reducing mortality/morbidity of HF, CVDs and NCDs around the world, and especially in Mongolia. It is important for Mongolian health policy makers and health providers to be aware of patient needs and rising public health problems in Mongolia. Changing the entire health care system and developing totally different mechanisms to the ongoing system is not feasible today. It is important to look for the feasibility of any program or change. Therefore I believe that the most cost effective and feasible approach is to adopt an evidence-based HF disease management and patient education program in the health delivery system in Mongolia. All the interventions from the disease management program target the behavioral change and the elimination of risk factors that have been directly associated with the heart conditions. They also focus on delivering the necessary knowledge about a patient's own health condition; making sure that they understand that it is a part of the treatment plan. Development of a disease management program might be a challenge, but it is a necessary change that many Mongolians need. The HF management

program promotes patient's self-management and self-management tools. It is difficult for a patient to deal with HF alone, and if some habits are not corrected HF patient lifespans will be shortened significantly, their quality of life drops, and health care cost will rise greatly. In conclusion, this paper is written to bring awareness among Mongolian health professionals and health policy makers about this hidden and very serious public health problem in Mongolia. In addition, I am proposing to develop and exercise the most appropriate, culturally adaptable and efficient HF disease management program and patient education in Mongolia, particularly in hospital settings.

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